

Claims

I Claim

1. A method for culturing cells or microorganisms, comprising the steps of:
providing a flexible sterile plastic reservoir;
introducing a culture media into the reservoir;
inoculating the culture media with a cell or microorganism to provide a cell suspension;
aerating the cell suspensions with a fluid at a flow rate;
detecting a characteristic of the cell suspension;
and
varying at least one of the flow rate of the aerating fluid and the composition of the aerating fluid in response to the detected characteristic.
2. The method of claim 1 comprising the step of releasing aerating fluid from the reservoir.
3. The method of claim 1 comprising the step of circulating the cell suspensions.
4. The method of claim 1 wherein the reservoir comprises an opening and the method comprises the step of providing a closure having a port in fluid communication with the reservoir, wherein the closure forms a fluid-tight seal with the reservoir to seal the opening.
5. The method of claim 4 wherein the step of inoculating comprises inoculating the culture media through the port in the closure.

6. The method of claim 4 wherein the step of aerating comprises aerating the cell suspensions through the port in the closure.
7. The method of claim 1 wherein the step of aerating comprises bubbling the aerating fluid through the cell suspension.
8. The method of claim 4 comprising the step of circulating the cell suspension through the port in the closure.
9. The method of claim 1 comprising the step of sealing the reservoir to prevent a contaminant cell or microorganism from entering the reservoir.
10. A method for culturing cells and/or microorganisms, comprising the steps of:
providing a disposable liner forming a reservoir having an opening;
attaching the liner to a closure to close the opening;
introducing into the reservoir a cell suspension comprised of culture medium and one of cells or a microorganism;
culturing the cells or microorganism in the reservoir;
detaching the liner from the closure after culturing the cells or microorganism; and
attaching a second liner to the closure.
11. The method of claim 10 comprising the step of aerating the cell suspension with a fluid at a flow rate.

12. The method of claim 10 comprising the step of circulating the culture medium within the reservoir.
13. The method of claim 10 comprising the step of detecting a characteristic of the cell suspension and varying the aerating fluid composition in response to the detected characteristic.
14. The method of claim 13 wherein the reservoir is translucent, and the step of detecting a characteristic comprises optically detecting a characteristic of the cell suspension while the cell suspension is in the reservoir.
15. The method of claim 10 comprising the step of detecting a characteristic of the cell suspension and varying the aerating fluid flow rate in response to the detected characteristic.
16. The method of claim 15 wherein the reservoir is translucent, and the step of detecting a characteristic comprises optically detecting a characteristic of the cell suspension while the cell suspension is in the reservoir.
17. A method for culturing cells and/or microorganisms, comprising the steps of:
 - providing a first flexible plastic reservoir having a first opening;
 - introducing a culture media into the first reservoir;
 - introducing cells or a microorganism into the first reservoir;
 - closing the first opening;
 - providing a second reservoir having culture media;

- circulating the culture media between the first reservoir and the second reservoir through the first opening.
18. The method of claim 17 comprising the step of circulating the culture media within the second reservoir.
 19. The method of claim 17 comprising the step of circulating the culture media within the second reservoir with an aerating fluid.
 20. The method of claim 17 comprising the step of aerating the cells or microorganism with a fluid.
 21. The method of claim 20 wherein the cells or microorganism are aerated by aerating the culture media in the second reservoir.
 22. The method of claim 20 wherein the culture media and the cells or microorganism are combined to form a cell culture, wherein the method comprises the step of detecting a characteristic of the cell culture and varying a characteristic of the aerating fluid.
 23. The method of claim 22 wherein the characteristic of the aerating fluid is the flow rate of the aerating fluid.
 24. The method of claim 22 wherein the characteristic of the aerating fluid is the composition of the aerating fluid.
 25. The method of claim 22 wherein one of the first and second reservoirs are translucent and the step of

detecting a characteristic comprises optically detecting a characteristic of the cell culture while the cell culture is in the one of the first and second reservoirs.

26. The method of claim 17 wherein the second reservoir is a flexible plastic reservoir having a second opening.
27. The method of claim 17 wherein the step of closing the first opening comprises releasably sealing the first opening.